

An Essay
on
The Mucous Membranes
by
Geo. Halberstadt, of Penn.^a
for
The degree of Doctor of Medicine

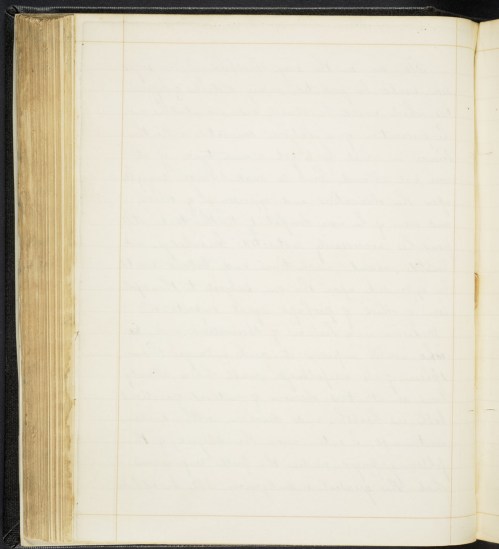
Passed March 4. 1829

Oct 1891
The Museum of Natural History
The University of California
The Department of Geology
The Department of Botany

Oct 1891

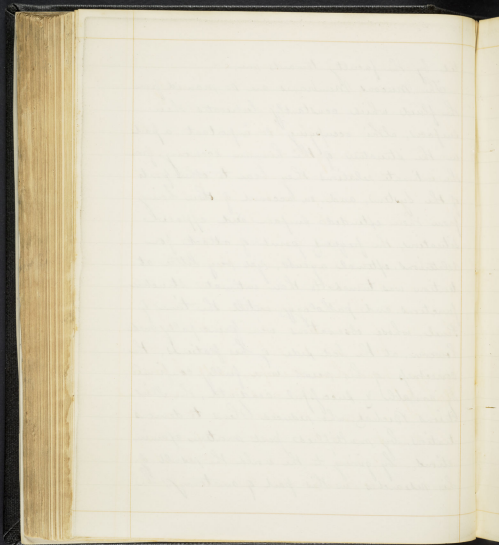
To one on the very threshold of the profes-
sion, would be presented many obstacles & difficul-
ties, which would be almost insurmountable, in
the prosecution of a subject connected with the
science, in which he is yet a mere tyro, if it
were not allowed him to make large draughts
upon the observations and experience of others,
and even if he were competent to the task, still
from his necessarily restricted knowledge and
limited means, much time and labour would
be expended upon the one subject to the exclu-
sion of others of perhaps equal importance.

Medicine is a science of observation, and, he
who would improve it, and enlarge the
sphere of its usefulness, must have already
been an attentive observer of nature's operations
both in health, and disease, with these
sentiments I enter upon the subject of the
following pages, under the full impression
that the greatest indulgence will be exhibi-



ted by the faculty towards me.

The Mucous Membranes are so named from the fluid which constantly lubricates their surfaces, altho' occupying so important a part in the structure of the human economy, from the intimate relations they bear to other parts of the system, and on account of their being from their extended surface and exposed situation, the frequent point of attack for deleterious external agents, yet very little attention was turned to their intimate structure, functions, and pathology, untill the time of Pinel, whose observations were principally made however, at the bed side of his patients, the correctness of his views were fully confirmed by an able & successful coadjutor, the illustrious Richat, who reduced them to demonstrations, by multiplied post mortem examinations, by giving to the world the result of his researches in this part of anatomy, the

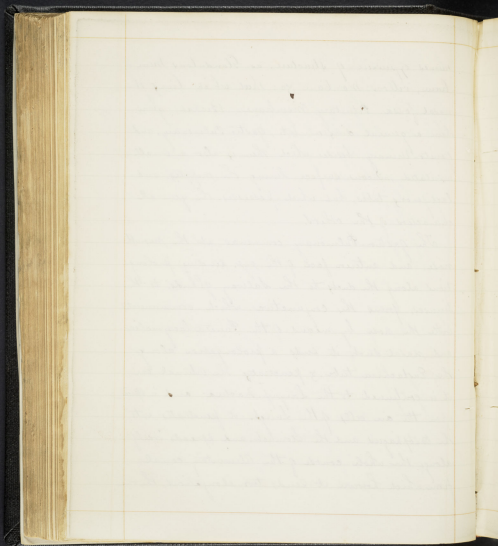


has obtained for himself a halo of imperishable fame. The profession cannot too sincerely regret the loss of his great and valuable talents, altho' he had scarcely reached the meridian of life, yet was his genius at its midday splendor, he was already looked upon by all Europe as the favorite child of science, and the brightest ornament of our profession, his name already held an exalted rank among those distinguished for mental endowment, and scientific acquirement. to his labours are we chiefly indebted for our knowledge of the tissues which will constitute the subject of this essay, from him therefore will I borrow largely. — The Mucous Membrane lines all the outlets of the body, in it are exhibited some of the most conspicuous phenomena of life, as Respiration, Digestion, secretion, excretion &c, it has received various

in which I have been engaged
since the year 1840 to the present
time. It is a very interesting
and important subject, and one
which has attracted the attention
of the public mind. I have
been fortunate enough to have
the honor of being elected
a member of the Academy
of Natural Sciences, and
of the American Philosophical
Society, and of the
American Association for
the Advancement of Science.
I have also been elected
a member of the
British Association for
the Advancement of Science.
I have been very
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Advancement of Science.

names expressive of structure, as Glandulous Mem-
brane, villous Membrane &c. that which lines the
nasal fossa. Mucous Membrane. Richet gives
them a general division into Gastro-Pulmonary, and
Genito-Urinary, besides which there is also a small
insulated mucous surface lining the nipples, and
lactiferous tubes, but which possesses the general
character of the others.

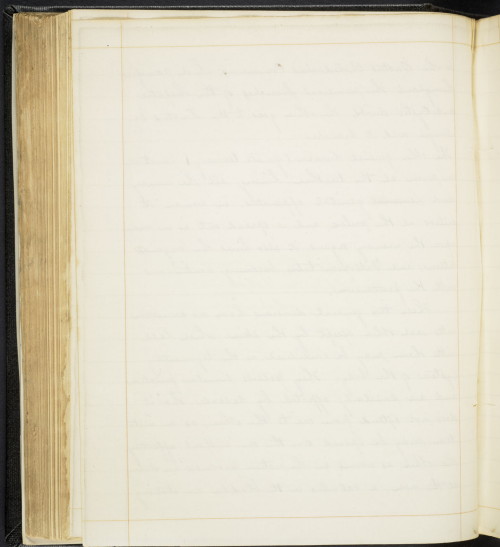
The Gastro-Pulmonary commences at the mouth
nose, and anterior part of the eye, sending prolonga-
tions along the ducts to the Salivary glands, to the
Lenses, forms the conjunctiva, which communicates
with the nose by means of the Foramen lacrymale
and nasal duct it sends a prolongation along
the Eustachian tube, & penetrating the internal ear,
it is continued to the Larynx, trachea: and is spread
upon the air cells of the Lungs, it penetrates into
the oesophagus and the Stomach, and spreads itself
along the whole course of the Alimentary canal,
from which however it sends two elongations, the one



to the Ductus Choleochilus Communis, which ramifies throughout the numerous branches of the Hepatic and Cystic ducts. The other goes to the Ductus Bile-
-dugii and its branches.

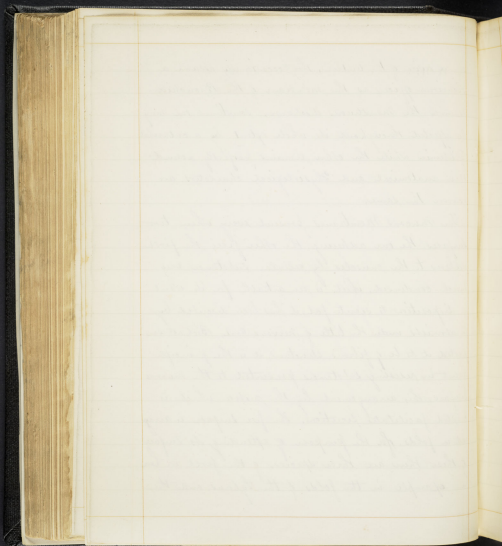
The other general division (genito urinary) penetrates in man at the Urethra, lining all the urinary and ~~seminal~~ genital apparatus. in woman it enters at the vulva, and is spread out as in man upon the urinary organs, it also lines the vaginal
-lition, and Fallopian tubes, becoming continuous with the peritoneum.

These two general divisions have no connection with each other, except by the skin, which with them may be considered as the tegumentary system of the body. They possess similar functions and are similarly affected by disease, tho' it does not extend from one to the other, as an irritation may be spread over the one without affecting the other, as worms in the rectum produces an itching at the nose, a calculus in the bladder an itching



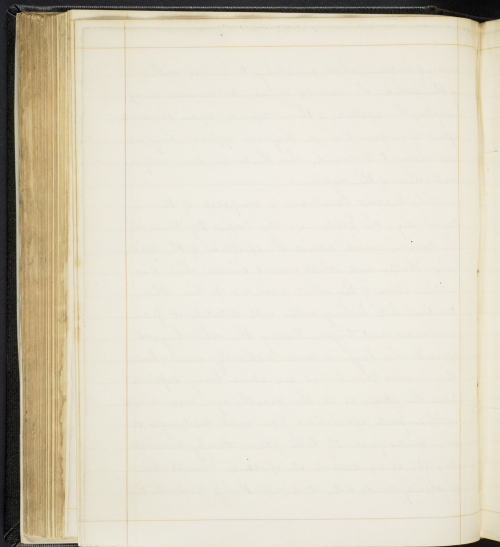
of the office of the latter, they occasionally assume a vicarious office, as the membrane of the Bronchia assumes the mucus discharge, sometimes one may be affected throughout its whole extent by a catarrh Epidemic while the other remains perfectly sound their anatomical and Physiological characters, are however the same.

The Mucous Membranes present every where two surfaces, the one adhering, the other free, the first adheres to the muscles by cellular substance very much condensed, which is remarkable for its want of disposition to secrete for, it has been described by Anatomists under the title of Nervous Coat, Richard suspected it to be of fibrous structure, it is the principal agent in resisting substances presented to the mucous surface, this arrangement by the motion which is created facilitates secretion, the free surface is arranged in folds, for the purpose of extending its surface of these there are three species, of the first we have an example in the folds of the Uterus, and the

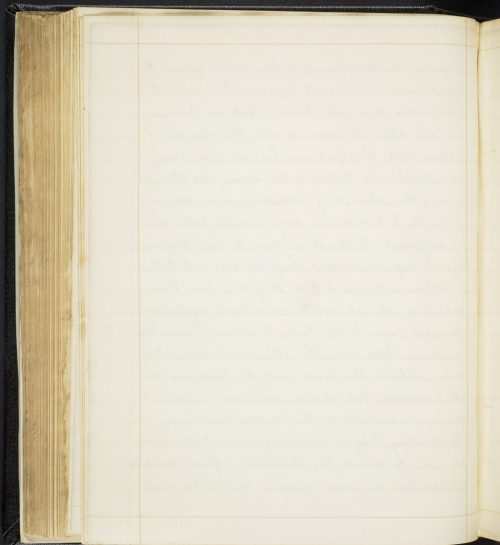


saliva of dolphins, which are always to be put with,
of the second, the salivula communis furnish an ex-
ample, the existence of these depends upon the small
extent of surface to which they are applied. They are
also always to be found, the fluids are seen only on
contraction of the organs.

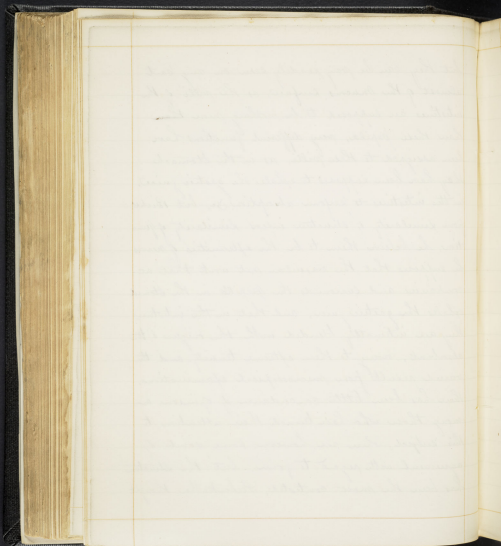
The Mucous Membrane is composed of three
layers, viz. the Epidermis, the Corpus Papillare, and
the Mucosa, most admit the existence of the Epider-
mis. Haller and others were of opinion that this
portion alone of the skin descended to line the
cavities, but boiling water will detach it from
the fauces and tongue, leaving the other layers
exposed. this layer is most distinctly seen where
the mucous Membranes are about being separated
from the skin, as at the mouth, eyes, nose, anus &c.
in these parts excretions from acid discharges or
other causes frequently take place, clearly demon-
strating it, as we descend its existence cannot be
so clearly made out, it is nevertheless probable that



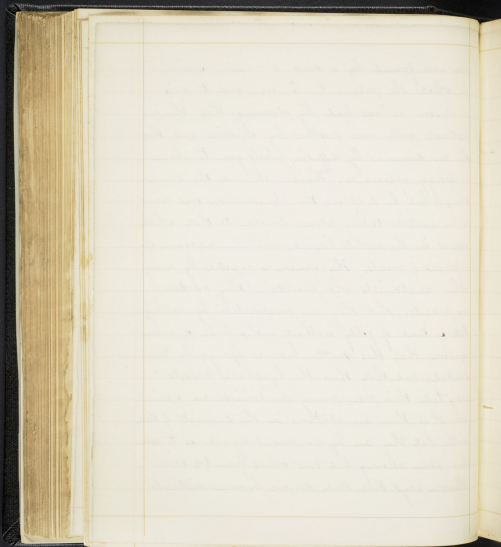
it exists, the development of this layer appears to depend upon the degree of exposure to which it is subjected, it is well known that in *Protophaga* and *vel utri*, it assumes all the characters of skin, and the Epidermis becomes very easily demonstrable, its texture is the same as the Epidermis of the skin, only possessing more delicacy, its use is to protect the very sensitive villi which lie subjacent to it, it is owing to this layer that an exposed mucous surface does not take on inflammation, and that they can bear the contact of external substances without effoliating. The next layer is the *Corpus Papillare*, herein the membranes differ from the skin, which has intervening between this layer and the Epidermis, the *rete mucosum*, but Reichel has never been able to discern its existence in the Mucous Membranes. The Papillary body is not easily demonstrable, upon this seems to depend the sensibility of these Membranes the papilla are most apparent on the tongue



but they can be very readily seen on any part almost of the mucous surface, as the villi of the intestines are supposed to be nothing more than these papillae, very different functions have been assigned to these villi, as in the stomach they have been supposed to secrete the gastric juices, in the intestines to perform absorption &c, but Richer from similarity of structure infers similarity of function, he believes them to be the extremities of nerves he supposes that the vascular net work that accompanies and surrounds the papillae in the stomach secretes the gastric juice, and that in the intestines they are intimately blended with the origin of the absorbents, owing to their extreme tenuity, and the varied results from microscopical examinations, there has been little concordance of opinion among those who have turned their attention to this subject, there are, however, some points of agreement with regard to form, but the structure has been the most contested, Lieberkuhn thought

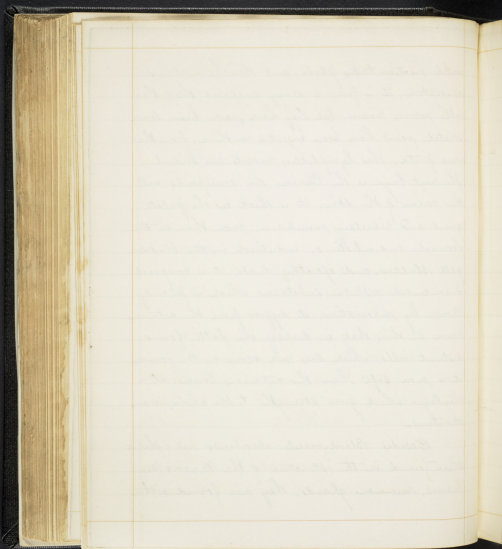


they were formed by a kind of cellular vesicle in which the plicae terminated, and to this conclusion he was lead by observing that the intestinal plicae were swollen by injection, and that the air driven in by diffusing Wholly gave to them a spongy appearance. Hewson observed the same thing, but he supposed the phenomenon was owing to an erection taking place, similar to that which occurs in the proctitis sicca, thro' the medium of a plexus of vessels. This opinion is rejected by many other anatomists, who maintain they contain no vessels, that they are constituted by nothing but a kind of jelly without either form or organization, that this matter becomes spongy by being soaked, and that thus the lymphatic vessels may take their rise, many anatomists are of opinion that there are apertures in the summits of these plicae, but they are by no means agreed as to number, some allowing but one, others from 6 to 10. Hewson says that these do not become distinct

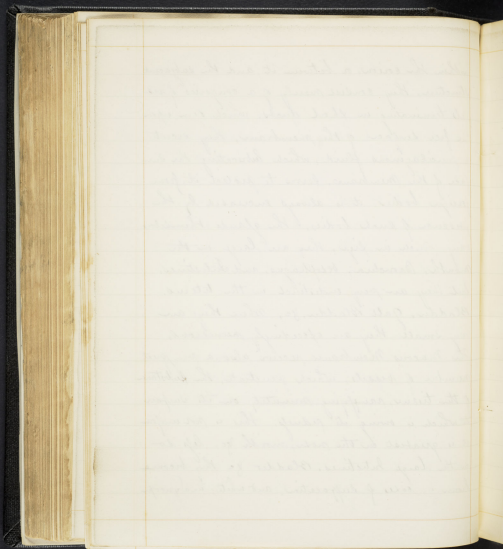


until section takes place, and thus he explains
absorption, it is from analogy supposed that these
villi receive nerves, but they have never been demon-
strated, pains have been injected in them, from the
vena porta, the lymphatic vessels are evident -
The next layer is the Chorion, this corresponds with
the corion of the skin, it is thick in the palate,
gums, and vitreous membrane, more thin in the
stomach and intestines, indistinct in the bladder
gall bladder, and excretory ducts, it is composed
of condensed cellular substance, which is plainly
shown by maceration, it differs from the cutaneous
corion in this, that in dissection the latter forms
distinct cells, which does not occur in the former,
it is more soft than the cutaneous corion, it is
this layer which gives strength to the whole peritoneal
structure -

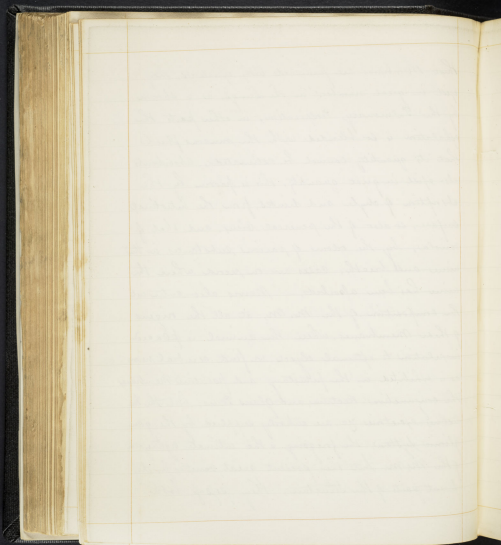
Besides Blood-vessels, absorbents and ephelae
they ^{are} found in the structure of the Mucous Mem-
branes, mucous glands, they are found either



within the corion, or between it and the subjacent structure, they consist merely of a congeries of vessels terminating in short ducts, which run upon the free surface of the membrane, they secrete a mucilaginous fluid, which lubricating the surface of the Membranes, serves to protect it, from foreign bodies it is always increased by the presence of such bodies, the glands themselves vary much in size, they are large in the mouth, Bronchia, Oesophagus, and Intestines, but they are very indistinct in the Uterus, Bladder, Gall Bladder, &c, where they are very small they are exceedingly numerous, the Mucous Membranes receive also a very great number of vessels, which penetrate the substance of the tissue, ramifying minutely on its surface to which is owing its redness, this is not uniform it is greatest in the nose, mouth &c, less so in the large Intestines, Bladder &c they become brown in cases of suppuration, and white in dyscrasias

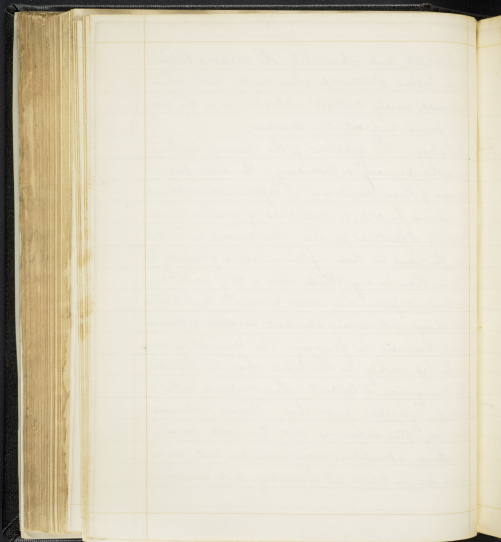


These Membranes are furnished with exhalents, they
exist in great numbers in the Lungs, as is shown
by the Pulmonary Respiration, in other parts the
exhalation is so blended with the mucous fluid
that its quantity cannot be estimated, Absorbents
also exist in great quantity, this is proven by the
absorption of chyle and drinks, from the intestinal
surface, or also of the puereral virus, and that of
varicolas, by the odour of various substances in the
urine and breath, cases are on record where the
urine has been absorbed, - Nerves also enter into
the composition of the M. M. at all the vigens
of these Membranes, where the animal is placed
in relation to external objects we find cerebral nerves
as is exhibited in the pituitary and palatine Membranes
the conjunctiva, Rectum, and Glands Penis, but the in-
testines, excretories &c. are entirely supplied by the gan-
glionic system the foregoing is the intimate organization
of the M. M. but they present great varieties in dif-
ferent parts of the structure, they possess both

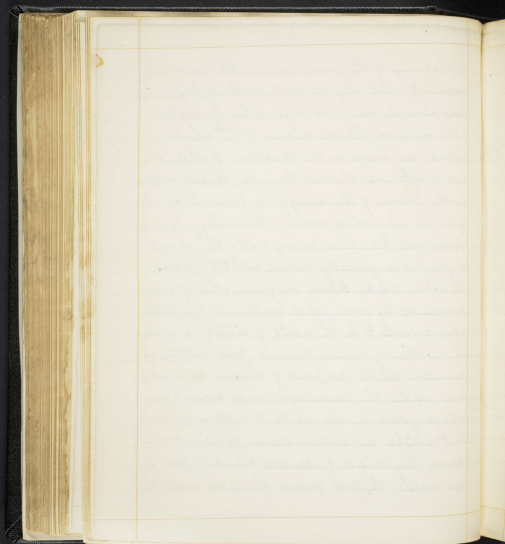


contractility and extensibility, the mucous tubes never become obliterated when empty, and when inflamed rarely contract adhesions, as is the case with serous and cellular structures.

Pathology. The affections of the mucous system are either primary or secondary, the most frequent disease of these membranes is Inflammation, commonly induced by cold, or vicissitudes of weather, hence Catarrhs, Dysenteries, &c. they often prevail as Epidemics, the pain in these inflammations is generally less intense, than in any others. There is very rarely any concomitant fever, they never terminate by adhesion, but always with a very abundant secretion of Mucus, rarely terminate in gangrene, this termination occurs much less readily, in this tissue than in the skin. The consequences of Catarrhs when compared with those of Erysipelas, prove this. Chronic Inflammation very often supervenes upon the acute form, sometimes adontitious membranes are met with as we see in Croup, and Dysentery, and occasionally



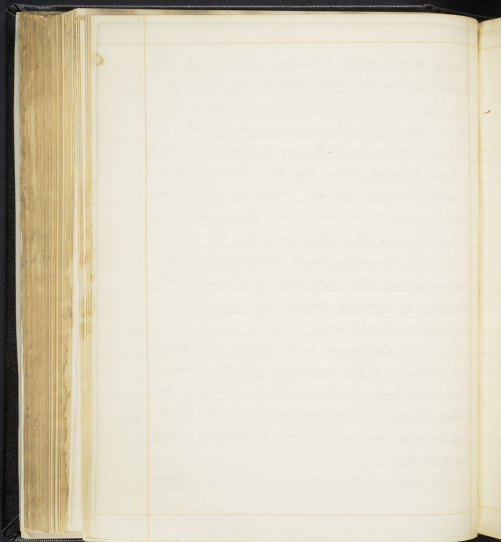
a thickening of the membrane results, another disease to which they are liable is Hemorrhagy, this takes place in one of two ways, either by rupture of the vessels, or thro' the medium of the exhalants, without any lesion in the structure, of which the last is by much the most frequent, Bischof reckons another species of Hemorrhagy viz Hemorrhoids, which holds an intermediate station, Hemorrhagy by exhalation may take place on any part of the mucous surface, it is generally divided into two species, the active, and the passive, the former, when it is accompanied by some febrile excitement, the latter, when it seems to be the result of debility, as is seen at the close of organic diseases, post mortem examination exhibits no mark of disease, it is uncertain, whether the hemorrhagies which occur from disorganization, are the result of rupture or exhalation, Aphthae are another disease peculiar to the M. M., they consist of ulcerated tubercles, there are two species, the first presents themselves under the



form of small round prominent ulcers, covered with a pellicle somewhat thick and closely adherent. They occur in the mouth, chiefly on the sides of the tongue. They are sometimes an inch in diameter, the other species are small tumours provided with excretory ducts, for which reason they have been regarded as small tumified glands. Altho are for the most part confined to the mouth, and throat, but when of long standing they extend down thro' the whole tract of the alimentary canal, producing painings, flatulencies, and other disagreeable symptoms. Sometimes they occur as a chronic disease. They may be either Idiopathic or Symptomatic.

Fungi are also found in the M. M. They consist in a thickening of the Membranes. They are found in the sinusses, nose, mouth, and larynx, when they are called Polypi. They are very vascular, and bleed very readily. They are by some considered as a species of Cancer.

All these affections may be purely Symptomatic

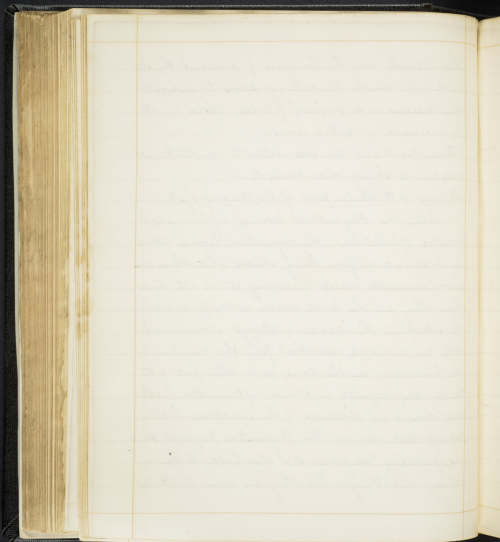


thus, Catarrhs may be the effect of disease of the stomach, the mucous Hemorrhagy seems to indicate other diseases in a majority of cases, apthae are often the consequence of febrile fevers.

These Membranes are also liable to constitutional maladies, as Scanty and Benevolence -

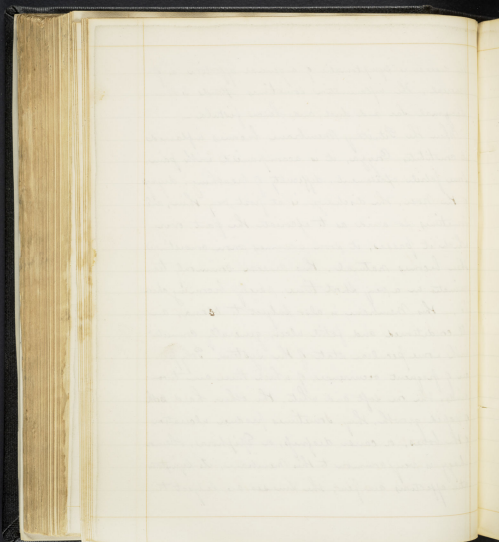
Diseases of Particular parts of the Mucous System -

When the Conjunctiva becomes inflamed, it is called Ophthalmia, the conjunctiva becomes altered in its appearance, from being almost white, there are now innumerable vessels traversing it in all directions, they are the most visible in the part covering the sclerotics. This disease is always accompanied with an increased secretion from the membrane, the terminations are the same as in other parts of the tissue, very frequently in chronic inflammation, in this case there is an abatement of the symptoms, but the redness still remains, the Conjunctiva frequently thickens, producing Pterygium, it is also liable to Hemorrhagy, and Ulcers, but they are rare, sometimes



The disease is symptomatic of a general affection, as of venereal, the inflammation sometimes extends to the Lacrymal Sac and duct, and hence fistula -

When the Pterygial Membrane becomes inflamed it constitutes Oryza, it is accompanied with pain, some fetid excrement, difficulty of breathing, dryness of the Nose, the discharge is at first very thin, and sometimes so acid as to excoriate the part over which it passes, it soon assumes more consistency then becomes natural, this disease commonly terminates in a very short time, rarely becoming chronic. The Membrane is also subject to Osena, an ill-conditioned and fetid ulcer, generally connected with some peculiar state of the System. Polypus an of frequent occurrence, of which there are two kinds, the one soft and white, the other, hard, both of rapid growth, they sometimes produce ulceration of the bones, or cancer deepness, or Epiphora, Hemorrhage is very common to this Membrane, its symptomatic affections are few, the sinusses are subject to



the same disease. The Eustachian tube is some times thickened by inflammation producing deafness. The membrane of the mouth rarely inflames, and when it does it is generally by continuity. Aphthae some times occur, so also Hemorrhages, but these last are very rare, and generally depend upon Gungi. The tongue is sometimes covered with small deep pustules. There may also occur in the mouth milium eruptions.

The Pharynx is often affected with inflammation it is treated of under the names of Angina, Cynanche of which there are two kinds, as it may affect the larynx or Pharynx, when it occurs in the latter, it is either Idiopathic or Symptomatic, the former is the most common arising from cold, it is accompanied with pain, difficult deglutition and some fever, terminates generally by resolution, this same name is also given to ulceration arising from a venereal taint -

The Larynx and Trachea are also subject to inflammation, called Cynanche, the first Cynanche

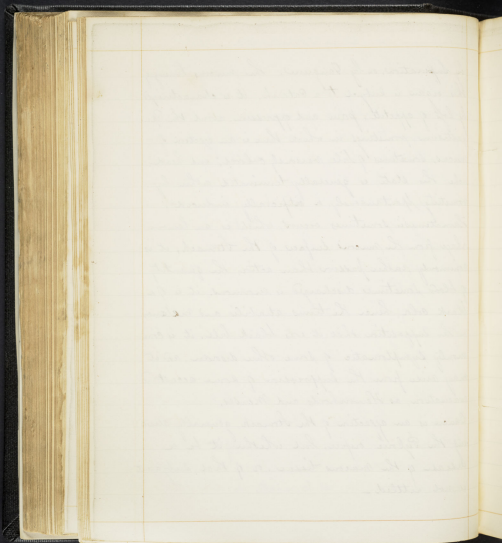
Yarngers, the latter *Cynanche trachealis*, or Croup, they have many symptoms common to both as pain, fever, painful deglutition, peculiar voice &c. this inflammation may terminate in gangrene, this part of the mucous Membrane being more susceptible of it, than any other, sometimes the inflammation becomes chronic, it is often associated with Pulmonary Consumptions Hemorrhage is a common affection of the Lungs, most commonly it is symptomatic of *Tuberculosis*, it occurs from rupture or exhalation, more frequently the latter. The diseases of the pulmonary mucous Membrane are either Idiopathic or Symptomatic.

The Oesophagus is subject to inflammation. Aphthae are sometimes found, Hemorrhage or Catarrhs rarely occur in it.

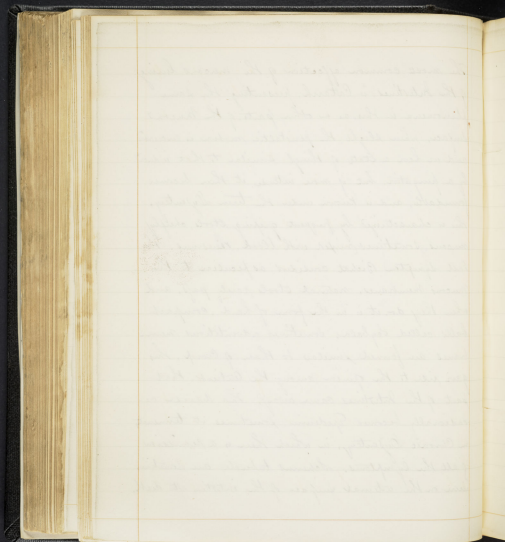
The Stomach is frequently the seat of Inflammation arising from acid matters taken into it, this is accompanied with very violent symptoms, as severe pain, profuse vomiting when any thing is swallowed, restlessness, anxiety &c. it terminates by Resolution.

by supuration, or by Gangrene, the mucous lining of this organ is subject to a Catarrh, it is characterized by loss of appetite, pain and oppression, about the Pyloric region, vomitings in which there is an ejection of mucus, sometimes of bile, variously colored, and head-ache, this state is generally terminated either by vomiting spontaneously, or artificially induced, Hematemesis sometimes occurs, which is an hemorrhage from the mucous surface of the stomach, it is commonly rather passive, than active, the quantity of blood sometimes discharged is enormous, it is of a black color, hence the terms atrabilis and melenas, on the supposition that it was black bile, it is commonly symptomatic of some other disorder, and it may arise from the suppression of some accustomed evacuation, as Hemorrhoids and Menstrues.

Cancer is an affection of the stomach, generally attacking the Pyloric orifice, but whether it be a disease of the mucous tissue, or of that subjacent is not settled -

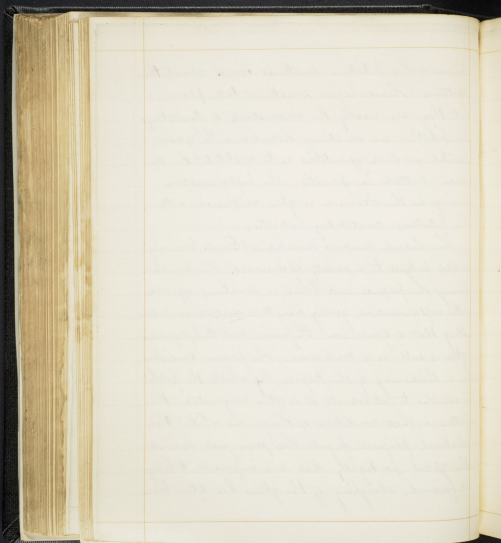


The most common affection of the mucous lining of the Intestines, is Catarrh, presenting the same phenomena in this, as in other parts, of the Mucous surface, when slight, the peristaltic motion is increased and we have a state of things similar to that induced by a purgative, but if more intense it then becomes formidable, and is known under the term Dysentery. This is characterized by frequent gripping stools, chiefly mucous, sometimes mixed with blood, &c. &c. The last symptom Bichet considers as peculiar to the Mucous Membranes, natural stools rarely pass, and when they do, it is in the form of hard, compact balls, called Stybalas. Sometimes adventitious membranes are formed similar to those of Cramp, this gives rise to the opinion among the Ancients, that part of the Intestines came away. This disease occasionally becomes Epidemic, sometimes it terminates in Chronic Dysentery, in which there is a persistence of all the symptoms. Schinn's tubercles are sometimes seen on the internal surface of the intestine after death.

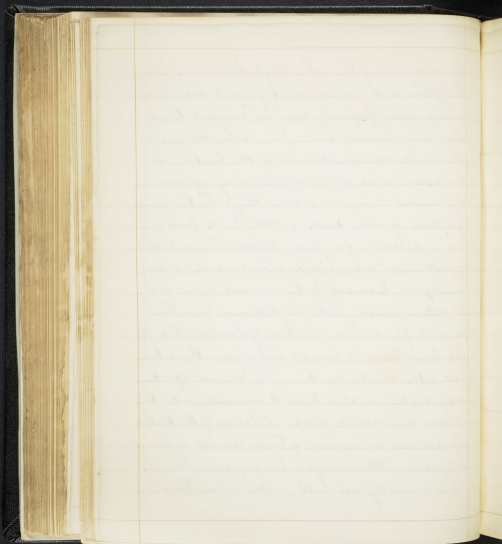


Cancer of the Intestines sometimes occurs about the
Spleen. Hemorrhages sometimes take place,
but they are mostly the concomitants of Dysentery.
The Intestines are sometimes distended with gases
secreted in such quantities as to constitute the dis-
ease called Tympanitis, the inflammation
arising in the Stomach is often continued into
the Intestines constituting Enteritis,

The Second Mucous Membrane (Genit. Urinary)
is also subject to a variety of diseases. The Membrane
lining the prepuce and Glans is sometimes affected
with inflammation, giving rise to a discharge resem-
bling that of Gonorrhea, Phymosis and Paraphimosis
often result as a consequence, the former consisting
in a thickening of the prepuce, by which the patient
is unable to retract it, it is often congenital, the
latter is that condition of things in which the
thickened prepuce binds the penis just behind
the glans, so tightly that it is impossible to bring
it forward, sloughing of the glans has often been



the consequence of this when neglected, ulcers upon
the glands and prepuce are of frequent occurrence,
arising most frequently from a venereal taint,
they may, however, occur from other causes.
The most common disease of the urethra is
Gonorrhoea, which is an inflammatory affection of
the mucous lining, it is characterised by the usual
symptoms of other kinds of catarrhs, i.e. local pain
and a discharge of a fluid at first thin and scanty,
afterwards more viscid and abundant, it may
or may not be cured by the venereal virus, it was
an ancient opinion that the discharge was the
seminal fluid, hence the term Gonorrhoea, but it
has been shown to have its origin from the entire
part of the canal, sometimes the disease spontane-
ously ceases, at other times it degenerates into the
chronic form called gleet. Stricture of the urethra
is a common consequence of Gonorrhoea, it is always
idiopathic. Haemorrhages are very rare. Cancers
are occasionally met with, in women Gonorrhoea



is a disease of less consequence than in Men,
the Vagina is the seat of it in them. The symptoms
are nearly similar, being however, much milder,
the mucous lining of the Vagina is liable to a
disease very much resembling Gonorrhea, and
which, indeed, it is difficult to distinguish from
it, it is called Leucorrhoea, or Fluor Albus. This
exists independantly of any venereal contamination,
it is in its nature very analogous to Coryza.

The Mucous Membrane of the Uterus is frequently
the seat of Hemorrhage, this is produced by abor-
tions, by any violent exertions, general plethorage.
They are more likely to occur during pregnancy,
about the period of the fifth month. The discharge
of blood is often very profuse. Cancer is a disease
to which the Uterus is subject, taking place generally
about the period of the cessation of the Menstrue.

Fungi sometimes occur in the Uterus, they are
of very luxuriant growth, filling up the
whole cavity of the Uterus, sometimes presenting

Removes at the labia, they are very vascular and bleed easily, they are also readily reproduced.

The Mucous Membrane of the bladder is often irritated, producing a Catarrh. This disease is common with old people, there is discharged with the urine a large quantity of mucus.

Ulcers are sometimes found in the bladder, they are accompanied with pain, difficulty of voiding the urine, with some discharge of blood.

The mucous lining of the Pelvis of the Kidney, and of the Ureter, may also be in a state of irritation from the passage of a calculus -

